

## Claims

1. A pendulum impact test rig for conducting crash and impact experiments, comprising:
  - 5 a supporting structure attached on either a base or on the solid ground;
  - a pendulum arm attached to said supporting structure wherein said pendulum arm is capable of providing a controllable center of percussion within a certain range;
  - a holding fixture mounted to said base or solid ground with a fastener at a suitable location for holding a specimen to be tested;
  - 10 a striker releasably attached to said pendulum arm by an attachment means for impacting said specimen for different impact configuration; and
  - a weight changeably attached to said pendulum arm by attachment means for accommodating different impact energy required.
- 15 2. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 1, wherein said supporting structure comprises of a pair of "A" structure supporting frames, constituted of: 4 inclined upstanding structural frame members; one horizontal main frame member secured to the vertex of said upstanding structural frame members; two horizontal structural frame members
  - 20 which are secured to and extend between said horizontal main frame members respectively; and a plurality of small plates attached with an attachment means at the bottom of said main frame members which are used to secure said supporting structure to the said base with an attachment means.
- 25 3. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 2, wherein said horizontal main frame member further comprising a mounting means for mounting a pair of brackets that hold a shaft of said pendulum arm and a housing for a means of bearing for both ends of said shaft are fitted into with any fitting means.
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4. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 3, wherein said pendulum arm further comprising two inclined frame members which are attached at one of their end to both left and right sides of said pendulum arm whilst the other end are attached with an attachment

means to said shaft by attachment means and plurality of fixed masses are securely attached to the end of said pendulum arm by attachment means.

5. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 4, wherein said pendulum arm is T-shape in cross-sectional view.
6. The pendulum impact test rig for conducting crash and impact experiments as claimed claim 4, wherein said plurality of fixed masses are fabricated from high density materials and comprises of a steel box filled with lead.
7. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 6, wherein said shaft is driven by a reversible driving means through a clutch coupling means to aid in hoisting and quick releasing mechanism of the pendulum arm, where said reversible driving means is connected to a pulley means via a mechanical or electrical driving means.
8. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 7, wherein said striker is fastened to the flange of the pendulum arm via a fastening means and said striker is mounted preferably in such a way as to facilitate removal for replacement and also for ease of exchanging different designs of striker
9. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 8, wherein said pendulum arm comprises of a plurality of holes, drilled along the end portion of said pendulum arm to allow a range of different mounting locations for the striker.
10. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 9, wherein said striker formed of steel which is made of high wear and impact resistant material
11. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 10, wherein said striker is made hollow instead of solid.

12. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 11, wherein said striker further comprising a striker base, which is attached to the said pendulum arm; and a striker head, which is attached  
5 with an attachment means to said striker base.

13. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 12, wherein said striker head can be of different shape depending on the impact and experimental requirement.

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14. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 1, wherein said attachment means of said weights is effective with a pair of supporting bars where said weights are changeably added through slotting, and further secured with a securing means.

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15. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 14, wherein said weights are made from high rust resistance and high density material.

20 16. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 15, wherein said holding fixture specially design to conduct impact test on motorcycle front wheel-tyre assemblies comprises of: a pair of trapezoidal plates; a laterally adjustable secondary bases, where each said trapezoidal plate is being attached with an attachment means; and a thick common  
25 base, where both of said secondary bases are then attached to with an attachment means, and in turn attached to the base or the ground.

17. The pendulum impact test rig for conducting crash and impact experiments as claimed in claim 16, wherein said common base is adjustable in a direction  
30 perpendicular to motion of the secondary bases.

18. The pendulum impact test rig for conducting crash and impact experiments as claimed in any claim 1 to 17, wherein said pendulum impact test rig is further equipped with a fast speed photo capturing means to capture deformation images; a

measuring means to capture impact velocity history; an electronic means to trigger data acquisition; a mechanical or electrical driven means to raise the pendulum arm to required height; and a mechanical or electrical releasing means to release the pendulum arm.